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A SCIENTIFIC SKETCH OF UNTRUTH.

THE chief object of this article is to show untruth in its general relations to scientific principles: its origin, necessity, utility, justification, and limitations; how it arises in the human brain, and how it affects human progress. In previous publications I have submitted views on kindred subjects, viz., *The Scientific Basis of Morality*, (Sonnenschein, 1899); "How the World is Governed," (*The Empire Review*, February, 1903); "The Coming Scientific Morality," (*The Westminster Review* and *The Monist*, April, 1904); "A Scientific View of Consciousness," (*The Monist*, April, 1905); "How Universal Energy Governs Mankind," etc. In these publications I have adduced evidence to show that the rudiments of our thoughts and actions can be traced down and merge into the properties and changes of the material elements of which we and our environments are composed. In consequence of the complexity and comprehensiveness of the subject the present article requires attentive reading.

I. GENERAL SCIENTIFIC RELATIONS OF UNTRUTH.

By the terms "truth" or "knowledge" I mean ideas which are consistent with all known facts and with all conclusions properly drawn from them; and by "untruths" I mean statements which are not consistent with facts. That is not knowledge which is not true. It is a strict rule in real science to limit belief to the evidence, and to

exclude all inconsistent ideas, otherwise truth could not be attained, but our mental faculties are so weak and our lives are so short that in ordinary affairs this rule is often disregarded. The human brain also is so constituted that it retains almost any impression, whether true or false, which is strongly made upon it, and we therefore often believe, though we do not really know that which is untrue. The mere antiquity of a belief is not a proof that it is either true or permanent, the ancient one that the sun moved around the earth is an example.

Next to life itself truth is our most valuable possession. As mere belief is often treated as truth, multitudes of persons are willing to suffer almost any pain for the sake of their beliefs, whether true or false, and under this influence many have sacrificed their lives as martyrs, missionaries, explorers, and discoverers. The chief explanation of this fact is that a strongly-fixed cerebral impression is part of the nervous structure, and like a mark of small-pox, is constantly renewed as it wears out. The strength of some fixed beliefs is so great that under their influence thousands of innocent witches and heretics have been slaughtered and burned alive by believers in unprovable dogmas. In consequence, also, of the incessant action of our environment upon us, our love of pleasant falsehoods is so strong that new ones are frequently invented to gratify us. The extent to which we accept and practice untruth indicates the degree of uncertainty of our ideas, and the limits of our love of truth.

As truth and untruth are ideas almost wholly confined to human beings, they are only manifested by an extremely small portion of nature; but they seem large and important to us because they affect us so personally. Science has proved that we are mere specks of matter in the cosmos, animated by its all-pervading motion; we come and go, but the world continues, and we only possess anything for

a lifetime, a mere speck of eternity. Each man perceives only a very minute portion of nature, and understands immeasurably less, and the more ignorant he is the more familiar he assumes to be with the greatest mysteries. The comparative unimportance of man in the universe is shown by the extent to which he is sacrificed by great natural actions, such as earthquakes, volcanic outbursts, hurricanes, diseases, etc.

The human brain is only partly developed, and our intellect is so weak that in nearly all complex questions such as that of morality, we are often compelled to guess conclusions, and this is especially the case in apportioning punishment or reward. The extreme feebleness of our senses and reasoning-powers, even with the aid of scientific appliances, limits nearly all our ideas. There is consequently a maximum of knowledge beyond which we cannot attain, and all additional unknown truth is to us an infinite void. A photographic surface is in this respect similar to the human brain, in that all beyond a small portion of the solar spectrum makes no image upon it, and is to it an entire blank. Further, as we estimate nearly all things by our own little selves, the pains we endure prevent our taking a true view of our position in nature, and the immense amount of human misery around us blinds us to the fact that untruth and pain are largely necessary to human progress and development. In addition to the very limited power of our intellect, and the inconceivable vastness and complexity of nature, nothing is either fixed, final, or quiescent; all things are moving, our mental condition is always changing, and it is largely in this way that many enquirers after the truth, especially in psychical questions, are baffled in their researches, they cannot realize all the possibilities of error. Varying degrees of probability also limit all our thoughts, and we cannot venture safely beyond them.

In addition to these causes of untruth, very few persons think alike except in well-verified science; there are also two or more different aspects of every moral, social, and political question. It requires broad views as well as narrow ones to get through life safely, the narrow view is—"this is a wicked world," whilst the broad one is—"whatever is must be, under all its conditions and circumstances." Nature is full of seeming contradictions, but has no real ones, and we are compelled by our environments to believe both truth and untruth. Our capacities of receiving truth and untruth depend largely upon the properties of our nervous system; thus, dullness of the senses considerably prevents cerebral impressions. In interpreting such impressions, we are usually actuated more by feeling than by reason because our environments act first upon the senses, and only through them upon our intellect, and power is lost in the process. Our feelings are our first guides, and act automatically. We imagine both truthful and untruthful ideas spontaneously to a very large extent; and there are many persons who live almost entirely automatically, without the help of much knowledge or intellect. It is not so much because an idea is true or false that we fail to accept it, but because the brain is unprepared to receive it, or because it contradicts our previous ideas and confuses us. The ability to receive truth depends largely upon the kind and amount of knowledge already possessed, thus he who does not know the alphabet cannot read; similarly, unscientific persons cannot readily accept the scientific basis of morality.

Notwithstanding that untruth is regarded as a species of "sin" to be "stamped out by means of religion," do what we may, we cannot prevent our environments producing it, nor alter the principles upon which the universe and mankind are governed, and which lie at the root of the matter. The only effective preventive of untruth is the

gradual discovery and diffusion of truth, and this can only take place at a very slow rate, because rapid improvement of human beings is more than they can bear.

An extensive examination of books and articles in reviews, etc., on moral and theological subjects, shows that the entire topic of "untruth," "sin," and "evil" remains even now a tangled mass of vague complex statements, which no man can clearly understand. Nearly all such publications are largely written as if the fundamental powers and principles of science have no existence and exert no influence upon man's moral ideas or actions. This is largely due to the difficulties of the subject, and to our feeble apprehension of fundamental science—a special professorship of the chief principles of science in each university might perhaps help to remedy this omission. To live without adequate knowledge of the powers which govern the universe and mankind is largely to "live without God in the world"; but we have little choice in the matter.

In some exceptional cases even clever scientific men seem to lose their reason when they attempt to harmonize science and dogma. Thus Faraday, when asked how he could believe theological doctrines inconsistent with science, replied, "I prostrate my intellect." It is, however, a conspicuous fact that nearly all of the thousands of able scientific discoverers have avoided such subjects, largely because of their confusing nature, and especially because of the great number of untruths and inconsistencies associated with them. The attempt to harmonize science and dogma is nearly always a failure, and whilst we may consider unproved statements as such, in order to test them, we cannot with safety fixedly believe important ones without proper and sufficient evidence, and if the evidence is insufficient we must wait for more.

Inconsistency is a degree of untruth and often a first

sign of insanity; no man can believe in dogmas, miracles, ministering angels, the existence of spirits in space, life or mind without matter, etc., and at the same time in the fundamental principles of science, without suffering cerebral confusion, because the two sets of ideas are contradictory. A proof that the methods employed by scientific discoverers, viz., experimental observation, meditation, and inference, are reliable, and those used by supernaturalists are not, is the fact, that whilst tens of thousands of new truths have been found by means of the former, few or none have been evolved by the help of the latter. The great failure of untruth as a means of discovery does not, however, prove that it is useless or entirely unjustifiable.

2. THE ORIGIN OF UNTRUTH.

Of what is termed the "first cause" of truth or untruth we know nothing, simply because it is beyond the limits of human power:

"Heaven from all creatures hides the book of fate,
All but the page prescribed, their present state."

—Pope.

Any natural action, such as thought, is only one in an infinite series of events, and our perceptive power is altogether too limited to enable us to trace our ideas back to a "first cause" in the infinite past. The deepest cause, both of truth and untruth, so far as we can at present trace it, is the universal motion within and around us, which is always acting upon our cerebrum and producing impressions. Physicists well know, from the phenomena of astronomy, spectrum-analysis, heat etc., that all substances, whether living or dead, are in this state of perpetual and indestructible motion; and that this motion acts upon all things by means of radiations through the ether. It acts upon men, and compels each man to influence his fellow-man, and his fellowman to influence him.

The origin of untruth depends further upon the fact

that all bodies, whether living or dead, have but limited powers, and that the intellect of man can only imperfectly distinguish truth from error; this human feebleness is largely due to the small range of the senses, the immensity of the universe, and the almost infinite complexity of nearly everything in it. The smallest irregularity, or weakness of action of the senses or intellect, also produces false ideas, and it is largely in this way that untruth and "sin" enter the human brain. A multitude of untrue impressions arise from the circumstance that we magnify the importance of everything we feel, and pass unnoticed the greatest of truths if they do not affect our consciousness. Even the life-supporting substance, oxygen gas, was not discovered until the year 1774.

It is well known that truth is mingled with untruth in every person, but it is not so obvious that the essential source of each, viz., the impressions produced upon the brain by the motion of its environments, is the same in all. The result produced is either truth or untruth according to the kind of cerebral impressions made and of those already present. If the incoming ideas are true and the brain is properly prepared, truth is received; but if either the new ideas are false, or the brain is unprepared, untruth is produced. Many impressions are made upon our brains without our perceiving them, and are occasionally revived in our dreams. They are often untrue because our intellect is not sufficiently awake to correct them. In consequence of differences of perceptive ability and of existing impressions in different persons, that which appears true to one person often seems untrue to another, thus the dogma of "The Immaculate Conception" appears true to Roman Catholics but is utterly false to physiologists and scientific men generally.

The reception or rejection, both of truth and of untruth is largely dependent upon the intellectual state of the brain.

Thus boys and girls are not admitted into higher-grade schools if they have not been properly prepared in lower ones; similarly, the brain of each person must already contain a sufficient number of true ideas suitable to correct the incoming ones by means of comparison and inference. It is largely through deficiency of truthful impressions and of suitable training, that ignorant persons are frequently untruthful. The universe is infinitely truthful, and the chief sources of untruth are in us. The greater the number of important truths we know, the smaller, usually, is the proportion of untruths we believe, because each important truth corrects and weakens some untruths. We are immersed in an unlimited ocean of mysteries, and in consequence of our very limited faculties, we believe a multitude of untruths respecting them.

The reception and rejection of truth and untruth are also largely dependent upon sensation and feeling. As our environments act first upon our feelings, and only secondly upon our intellect, the way we receive our impressions is usually decided by the feelings; if these are pleasant they are accepted, and if painful they are rejected. The ordinary automatic excitement of our brains, uncorrected by evidence and intellect, is a great source of untruth; thus we spontaneously imagine all kinds of false ideas. We fancy that we are stronger than nature, because of our numerous discoveries and inventions, forgetting that it is the energy of our surroundings which causes us to make these discoveries, and that nature has vastly more power over us than we have over it. We imagine that a "spirit" or an "ego" within us draws our conclusions, whilst the fact is, our conclusions are produced by the influence of the evidence and of our feelings upon our intellect, the cerebral impressions automatically causing the inferences by the aid of comparison. We fancy that our volitions are due to the "ego," not thinking that they may be produced

by unobserved stored-up cerebral motion. It is only by automatic action and re-action, accompanied by transference of energy, that we to a small extent "govern nature" by our volitions;—similarly, in our ideas of "choice, selection, and self-guidance," we overlook the fact that we are automatically compelled to perform them. It is well known that metals automatically "select" particular metals from mixed metallic solutions, and that crystals automatically "choose" pure ingredients from impure saline liquids with which to build up their structures, and therefore a mysterious "power" is not necessary to perform the same kind of work in us. Energy is always stored up in us from our food, and liberated under suitable conditions, and the so-called "soul in atoms" and "mind in plants" are probably different modes of motion in those different bodies. Neither the sun, nor universal energy is a "divinity," simply because it guides and governs terrestrial and heavenly bodies.

Some persons believe that "ministering angels" and beings of a higher order than man surround us, that vitality exists independent of matter, that space is tenanted both by human ghosts and vital ones, by spirits of dead plants and animals. But we do not possess satisfactory evidence which proves that these ideas are true; and such beliefs would be prevented by adequate knowledge of physiology. The radiation images emitted by substances, and which travel 186,400 miles a second, cannot be permanent spirits, because they are transformed, and cease to exist, when they fall upon other bodies. Another common error is that human thoughts and actions are "guided" by some "spiritual power" outside them, but the discoveries made by Newton, Joule and others, of the planetary movements especially, have largely proved that the universe is a self-guiding machine; that the energy in each act of change passes automatically from one substance into another and is altered in its form in the process, but without perceptible

loss or gain in total amount. Therefore there is no work left for "spiritual power" to perform. Such spiritualistic hypotheses are too complex and vast to be proved by mere human observation alone, they require a variety of well-verified evidence. Nothing less than the incorrupted testimony of inanimate substances, such as are employed in physics and chemistry, would be sufficient to fully justify us in firmly believing such important and extraordinary statements; and we must wait patiently for such evidence respecting them as Newton waited for Picard's measurements to prove the truth of the law of gravitation. The number and variety of forms in which untruth automatically arises in the human brain is practically endless, but the instances given are sufficient.

Suitable knowledge of science enables us to detect the rudimentary causes of nearly all our chief actions in plants, and even in minerals. Magnets and metals show distinctly the rudiments of heredity and of memory, and crystals show those of "choice" and "volition." Man is not the only deceiver, many other animals deceive, and although inanimate bodies do not actually utter untruths, their properties and actions suggest them. Thus the sun, during all ancient time appeared to revolve round the earth, until astronomers discovered the deception; and the weather is notoriously deceitful. The rudiments of various "moral and immoral" qualities in plants have been described by J. E. Taylor in his book *The Sagacity and Morality of Plants*. The statements made respecting the existence of "souls in atoms" and "mind in plants" are largely instances of incorrect nomenclature. Calling things by false names is common practice, and energy is not "mind" simply because it is motion.

Untruth is often an immediate result, either of ignorance or design. Many serious untruths have been invented and promulgated at different periods. Those of

the existence of a "heaven," a "hell," a "devil," and "immortality of the soul" are very ancient; that of "transubstantiation" was invented in the ninth century, that of the "Immaculate Conception" was made an article of faith in 1854; and the "Infallibility of the Pope in faith and morals" was decreed in 1870; and some persons even now venture to assert that "the value of a single soul is infinite." Untruth is greatly promoted by human conceit; in consequence of the incessant action of our environments upon our senses and feelings, the importance of everything human and personal is exaggerated. Thus we consider that "the universe was made for man," whilst it is incomparably more true that man is merely a denizen and an extremely minute fraction of this little globe. It is altogether beyond human power to adequately perceive its own littleness in the cosmos. The universe is one of truth, and the cause of our inability to truly explain it lies largely in us; we are simply deceived because we are ignorant. It is chiefly in consequence of the inconsistency between ordinary narrow views and comprehensive scientific ones that the entire subject of "sin and evil" is a vast paradox to unscientific persons.

3. THE JUSTIFICATION OF UNTRUTH.

Absolute compulsion justifies all things, even the immense destruction of human beings by great terrestrial catastrophes, epidemics, etc., and no exceptions are made in favor of men, whatever their sufferings or beliefs may be. The supreme question throughout nature is, not what is most truthful or pleasing to mankind, but what is most necessary to the well-being of the universe, and everything yields to this. The first effect of universal natural energy is to preserve the cosmos, and this is the greatest good because all other good things depend upon it; if this world was destroyed all mankind would perish with it.

"The first Almighty Cause
Acts less by partial than by general laws."
—Pope.

"Better for us, perhaps, it might appear,
Were there all harmony, all virtue here;
That never air or ocean felt the wind,
That never passion discomposed the mind,
But all subsists by elemental strife
And passions are the elements of life."
—Pope.

With every living thing there is action and re-action; life is a struggle and a conflict. The fox gains a living by means of deceit, and the incomes of many men and women are largely secured by means of untruth and unceasing competition.

The strongest power governs in nearly all cases; the stomach must be fed before the intellect, because it is the stronger influence. Our most pressing question usually is, not what is true, but how can we live and enjoy life. We are primarily governed by infinite energy, and our thoughts, whether true or untrue, are as necessary consequences of natural powers as the actions of inanimate substances. We possess no full proof that an act of thought is in any case an exception to this, but we have abundant evidence to show that our ideas require expenditure of natural energy to produce them. The formation of each truth or untruth in the brain is attended by consumption of heat. Each single idea also arises out of its immediately preceding cause, in accordance with the principles of continuity and equivalency of energy. We all think and act as we are compelled by our environments, and we cannot much prevent them forcing us to believe untruth as well as truth.

An opinion has long been held, though rarely expressed, that there exists some degree of justification of untruth, and this unpleasant conclusion is largely supported by evidence. Thus the simple facts that untruth

is a necessary consequence of the action of our environments upon us, and that each man thinks as he is compelled under all his conditions and circumstances, are alone sufficient to prove some degree of justification for it. The opinion is further supported by the fact that truth and untruth are essentially alike. Thus both are cerebral impressions caused by natural influences; each is limited by circumstances; each supplies pleasures and pains, consolations and disappointments; each is necessary to human progress; the use or abuse of either is rewarded or punished; and we justify each so far as we think it does good. There are all degrees of truth and untruth. Each has opposite effects according to its amount, so that if either is deficient, it does not sufficiently stimulate us to action, and if in excess it excites us too much. Both are governed by the influence of our environments, and are kept within certain bounds by their conditions. A due amount of truth promotes human progress, a deficiency fails to stimulate it, and an excess retards it by producing too rapid a change. Untruth aids progress by exciting conflict and discussion and retards it by misleading mankind.

There are, however, conspicuous differences between them, and although these are of very small value in the cosmos, their highly personal effects cause us to feel them keenly, and to exaggerate their degrees of importance. The chief ones are that truth is reliable, whilst untruth is not; truth is a safe basis for thought, prediction, and action, but untruth is always liable to be detected, refuted, and rejected; we cannot reliably predict future events from untruthful data; truth leads to new knowledge and scientific discoveries, but untruth does not; truth is consistent with all known facts, but untruth is not; untruths are often cheap at the outset, but dear at the end; while truths are the reverse. Truth is far superior to untruth as a guide of life, and as a consolation in times of distress, be-

cause it is trustworthy and unalterable. It is, however, much more difficult to obtain. The reliability of a man's word is largely proportional to his freedom from untruthful beliefs, because they prevent the reception of truth; and to his knowledge of the great principles of science, because they are the chief tests of truth and error. True views of nature and of human conduct yield the most permanent happiness. It is largely in consequence of deficiency of such knowledge that untruths are believed and propagated by many of the kindest men. Truth is the best stimulant to self-improvement. The acceptance of it is largely a question of education and training, and of how much self-sacrifice and labor a person is able to bear. Whilst truth imparts courage and self-reliance, the uncertainty of untruth weakens all our powers. Whilst too much truth is more than ignorant persons can comprehend, too much untruth is more than intelligent ones can bear, whence arises continual conflict between these two sections of mankind.

Untruths are fundamentally mere temporary expedients in the evolution of man. They are often unhealthy and a first step to insanity, and as untruthfulness often leads ultimately to suffering, we should be as careful about what ideas we accept as we are of what food we partake, and adopt similar general rules in accepting them. In consequence of untruth and ignorance, millions of persons are annually led into disease, misery, crime, insanity and early death; and it is only on acquiring sufficient knowledge of the chief powers and principles which govern the universe, and referring all questions to them for explanation, that untruth can be prevented from entering the human brain. Untruth is not accepted if we are trained well and possess, in advance, the knowledge necessary to correct it. But to entirely prevent it is impossible because that would require unlimited knowledge; the utmost we can do is to

correct and slowly diminish it. As all our attempts at avoiding it are extremely feeble in comparison with the magnitude of the task, we go on much in the same way from one generation to another. All mankind cannot be suddenly made truthful, and even if they could, each generation would still require teaching afresh. Belief in untruths generally must continue as long as mankind remains ignorant of the chief principles of science. Untruth, conflict and strife are inseparable from human life. Conflict is a result of motion; the whole of nature exhibits it, thus waves beat upon rocks and wash them away. All nature appears deceitful, but the real source of deception is usually the feebleness of our faculties.

Notwithstanding its drawbacks, untruth is a cosmic and human necessity. It is necessary as an element in the general evolution of man. We are in a state of gradual development, and require some stimulus to compel us to change. Truths and untruths, pains and pleasures stimulate us; they strengthen us if accepted rightly and are not too great for us to bear, and weaken us if in excess. The facts also that untruthful expressions are produced by the same natural process as truthful ones, and exist in accordance with the law of universal causation, are alone sufficient to prove their necessity. There exists some degree of virtue even in untruth, but our views are so narrow we can hardly believe it, thus, in common with other kinds of "evil" it is useful as a regulator of human progress. As deadly poisons, such as arsenic, prussic acid, and strychnine, are sometimes necessary to relieve disease of the human body, untruth may in some cases be necessary and justifiable to relieve distress of the mind. Through lack of knowledge and courage we frequently consider pain and untruth to be "evil" when they are not. The idea that truth and untruth are really evil when they produce pain, will not bear examination; the universe does not exist

merely for our pleasure, but we exist to obey omnipotent power. A large portion of the pain of life arises from our ignorance and false ideas, and another from great natural causes over which we have but little or no control, and all animals have to submit to it.

According to the widest scientific knowledge "whatever is, is right," but according to ordinary narrow ideas "this is a wicked world," and "there is something wrong in everything"; but even this dissatisfaction is useful because it excites discussion and stimulates change and progress. Untruth is only one form of a multitude of actions we term "evil," but according to science all these actions, ranging from the greatest physical catastrophes to mere exaggeration in men, are ultimate results of physical powers, and men are as perfect as the fundamental properties of the bodies of which they are composed allow them to be. Man is not imperfect because he is complex; a complex ocean-steamer is as perfect as a simple sailing-ship. Nor is he "sinful" because he is weak; his "sins" and the actions within and around him, arise out of the facts that all substances and creatures act, or fail to act, upon each other, according to their natural properties.

"Then say not man's imperfect, Heaven's at fault,
Say rather, man's as perfect as he ought."

—Pope.

and that when all is known and all is understood, mankind will see "whatever is, is good," and that man is working out his destiny by means of untruth and of truth.

Untruth has often more adherents than truth in complex subjects, chiefly because false explanations are frequently more pleasing or easily understood than true ones; and the question what is justifiable in any complex case, is never finally settled to the satisfaction of all persons, simply because very few persons think alike in complicated subjects. Nearly all persons practically support by their

conduct the conclusion that untruth is more or less justifiable. The amount of pleasure and stimulus afforded by it in tales, novels, plays, poetry, suggestive music, oratory, sermons, allegories, metaphors, dogmatic beliefs, miracles, pseudo-science, etc., is immense—the popularity of Bunyan's *Pilgrim's Progress* and *Robinson Crusoe* are familiar examples. And the consolation afforded by theological dogmas to millions of persons in distress or near to death, is abundant proof of its immediate utility, whether it is fully justifiable or not. The chief explanation of these facts is, that we are largely compelled to tell untruths by the influence of circumstances upon us, and because it is often a habit or personal advantage. It is of great use in helping us to acquire money, social influence, popularity, and success. A vast amount of it is employed in nearly all occupations, in trade, manufactures, literature, social appearances, sectarian teaching, etc.: it has been used to an immense extent in all ages to satisfy the almost universal desire for pleasure, even the prophet Jeremiah is reported to have said, "the prophets prophesy falsely, the priests rule by their means, and the people love it to be so"; and as untruth is so useful, it necessarily continues. Most persons tell untruths spontaneously, as far as they think it is for their advantage, as far as they dare, and as other persons allow them; and all are more or less occupied in defending themselves from the untruth and deceit of their fellows.

The same universal energy which produces changes throughout nature, compels us to use both truth and untruth in securing a maintenance. As life is and must be our first object, and untruth is so necessary in obtaining an income, we may not entirely condemn those who practise or diffuse it, but there is a limit to its justification, and whilst we should be tolerant towards others, we must protect ourselves from injury, both by untruthful persons, and

by advocates of too rapid advance; we require to be duly altruistic towards all men, and sufficiently conservative towards ourselves. Absolute necessity largely justifies the conduct of a criminal as well as that of the judge who condemns him to punishment. Persons are blamed and punished, not so much for their misdeeds as to deter them from doing wrong in the future. The fact that untruth is more or less necessary, justifiable, and good for mankind is one of the many painful truths we have to accept, whether we are willing or not. Similar arguments justify in various degrees all that we term "sin and evil."

The real scientific justification of an act is the degree to which it contributes to the welfare of the cosmos, therefore to that of all men, and not alone to our personal pleasure. The well-being of the universe, and "the greatest good" are nearly synonymous, and the noblest object of life is comprehensive utility. There are all degrees of "goodness," and that which does good, is more or less good whether it be a truth or an untruth, and the larger the "good" and the less the "evil" produced, the greater is the degree of justification. But "good in excess is evil," and extreme pleasure is painful. An excess of truth or of pleasure is more than some persons can bear, and much of the cheap goodness extant is hardly worthy of the name. There exist nearly all degrees of justification of untruth, ranging from that of automatic unintentional exaggeration to that of serious manifest falsehood. Such automatic falsehood is very prevalent, is often acquired by habit, and is a frequent sign of ignorance and defective training. But if some persons did not readily exaggerate the importance of money and pleasure they would not be sufficiently stimulated to obtain it, and if others did not over-value new knowledge they would not make the sacrifices necessary to discover it, and human progress would be impeded. As also the brains and nerves of different persons require

different degrees of stimulation to excite them, exaggeration is in some degree useful. In consequence of our very limited intellect in complex cases, some persons practice expediency and try to "appear all things to all men," but even this is a degree of untruth, and has some justification. It is only by faith in the greatest truths that we can be fully justified, and the most final court of appeal is consistency with all known facts.

How far untruth is justifiable in any particular case depends upon the circumstances, and as we cannot actually measure the value of these, we are only able to guess a reply, and act upon the degree of probability, and every different person guesses differently. This difficulty is usually diminished by employing juries, committees, etc., on the rule that "in a multitude of counsellors there is safety." Such cases are almost endless in number and variety, and give rise to continual discussion without arriving at any final conclusion. Justification of untruth is largely a personal matter which each man must decide for himself and accept the consequences. The practice of untruth, even for laudable purposes, lessens respect, because it shows our feebleness; and how far it is justifiable to believe and teach unprovable statements in important subjects is a serious question, and requires frequent revision as civilization advances.

4. LIMITATION OF UNTRUTH.

The general restrictions of untruth are much the same as those of truth: viz., how much our environments compel us to accept, and how much we are able to bear. As the properties and powers of nearly everything are limited, this restricts the effect of our surroundings upon us. Too much truth stuns us, and too much untruth repels us, and each excites our resistance. The untruthful man does as he must, and his victims do as they must in return in order

to protect themselves and restrain his conduct. The fact that both truth and untruth are kept within bounds by our feelings, shows that they are governed and limited by the stronger influence of our environments. Everything limits the action of everything of opposite property. Truth and untruth limit each other; intelligence and ignorance, ditto; the same with science and dogma; and with the advancing and retarding sections of mankind; we cannot simultaneously think of two opposite ideas; and even a Deity could not be infinitely just and infinitely merciful. Both truth and untruth are limited by rules of social conduct. Ordinary social life could not be carried on if untruth was too prevalent, or if too much new truth was suddenly made known. If ignorant persons had too great power there would be no supply of new knowledge and no human progress; and if the most scientific had too much control, the labor of self-improvement cast upon ignorant persons would be more than they could bear, even now millions of persons fail prematurely in the struggle of life. All these phenomena depend largely upon the great fact that every action requires time, and is almost wholly determined for us by natural powers.

Untruth in any subject usually lasts only as long as mankind is pleased or benefited by it. Old habits and false ideas die out; the dogma of all things being composed of "earth, air, fire, and water" has disappeared, and others are following it; even the view that the elementary substances are wholly inconvertible is being modified, for we now know that some of them change into others with extreme slowness. The use of truth is restricted in various ways similar to that of untruth; thus it may not be told at all times to all persons or under all circumstances; and if it is said with malicious intent, and not for public advantage, it becomes libel; untruth in cases of perjury is criminal. We must not use either truth or untruth so as

to inflict avoidable pain upon others, except in self-protection or defence: thus, although we may not speak the truth at all times or in all places, we may give evidence against criminals and confine them in jail, in order to ensure public safety and criminal reform. It is even good in some cases to keep other persons ignorant: thus doctors may not always tell the truth to their patients, lest it may delay their recovery; but they may mention it to their colleagues in consultation. Extremists in truth or untruth nearly always suffer; thus Bruno, Galileo, and nearly all advanced scientific men have been punished, whilst very ignorant persons are nearly always in distress. In all these cases universal energy acts so as to secure the greatest "good" to the cosmos, and compels each man to be more or less "a law unto himself," but "goodness" is largely unmeasurable.

The limitations and restraints put upon the use of truth and of untruth constitute a large portion of the subject of morality, and the natural explanation of each is largely the resistance of those persons who are pained by them. All our ideas are more or less limited by the sect, community, or nation, amongst whom we live—and we may not mention too freely truths which they dislike. We are surrounded by multitudes of circumstances which compel us to be either more or less truthful or untruthful. The number of untruthful ideas is greater than those of truth, and there are usually more ways of going wrong than right.

5. RELATIONS OF TRUTH AND UNTRUTH TO HUMAN PROGRESS.

The origin of human progress lies deep in the differences of internal motion of unlike material bodies. Each different person, or substance, by its different behavior or property, acts differently upon us, and produces our

growth, maintenance and decay. Food and friends support us, whilst poison and enemies kill us. The different influences act through our feelings of pleasure and pain; thus, through that of pleasure we are stimulated to desire more progress, and through that of pain we are compelled to avoid or diminish it. And in order to accomplish these objects we are driven to seek new knowledge; in this way, whilst our present information maintains our present state, scientific research evolves new knowledge for advance.

We only advance as fast as we are impelled. The rate of general progress is probably as certain and definite as that of the earth in its orbit, but owing to the immense complexity of the phenomena, and the limited extent of our powers, we are unable to measure it. The rate depends upon the fact that every action requires time; and upon the ability of the human body and brain to bear change. It is usually increased by truth, and decreased by untruth. It is largely regulated by the incessant conflict of the intelligent and the ignorant; whilst the former originate new knowledge and invent new applications, the latter prevent too rapid change. In accordance with the principle of equality of action and re-action, conflict is a part of our existence, and believers in truth and untruth constantly restrain each other. Untruth has two opposite effects upon human progress according to its strength; thus, if its strength is deficient, it fails to retard it, if in due amount it produces conflict and competition, and if in excess it retards progress by exciting too much resistance; an excess of new truths upsets our arrangements, and it is well known that although we cannot measure goodness we may have "too much of a good thing."

The greatest exception to the use of untruth is original scientific research; this occupation stands alone as the search for truth by reliable methods. Whilst untruth is entirely forbidden in it, unlimited faith in unproved state-

ments is insisted upon in theological teaching. In all real scientific research, dogmas and hypotheses are treated merely as questions to be tested. Its reliability is practically shown by the success of its predictions, and by the variety of ways in which the governments of civilized nations depend for advice upon scientific societies; and its extent is partly shown by the titles of hundreds of thousands of costly researches contained in The Royal Society Catalogue, eleven volumes of which, costing more than £10,000 have already been published.

6. CONCLUDING REMARKS.

The principles set forth in this sketch constitute a scientific basis of morality, and offer great scope for application in explaining the evolution and government of mankind; they enable us to distinguish truth from error in a multitude of complex cases, and are capable of rationally explaining "sin and evil"; they form the truest philosophy and supply the safest consolation in periods of distress to those who can comprehend the subject, because they are consistent with all known facts. Their practical applications are very interesting, because they affect all men, and every act of human conduct. A fixed belief that all persons are governed by universal natural causation, and "do as they must under all the conditions and circumstances," requires us to forgive our enemies; and a full conviction that the most moral rule of conduct is "to do the greatest good," compels us to remember their actions, because knowledge is necessary for our guidance and defence. In this way, whilst knowledge of the great principles of science increases toleration of "sin," it also increases obedience to law, and excites a due amount of conflict and progress. Even the valuable Confucian injunction, to "do unto others as we would have them do unto

us" is not as correct as science requires, because it does not take into consideration the fact that what we would have done unto us may not be "the greatest good" for others.

The whole of the evidence supports the common opinion that it is largely beyond our power to devise a better system of nature than that which already exists, and which causes our evolution as well as our existence.

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